

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions and listings of all claims in the application.

**Listing of Claims**

**Claims 1-32 (Canceled)**

33. **(Previously presented)** An apparatus for analysis of a plurality of biochips, each biochip comprising an array of electrodes and an auxiliary electrode, the apparatus comprising:

a plurality of stations, each configured to receive at least one of the plurality of biochips;

a plurality of thermocontrollers, each configured to independently thermally control one of the plurality of stations;

a plurality of interconnects positioned for electrical communication with the array of electrodes of a first biochip of the plurality of biochips and an auxiliary interconnect positioned for electrical communication with the auxiliary electrode of the first biochip;

a signal generator coupled to the auxiliary interconnect and configured to apply an input signal to the auxiliary electrode in the first biochip during an electrochemical measurement; and

a detector coupled to the plurality of interconnects and configured to receive an output signal from a first electrode of the array of electrodes of the first biochip during the electrochemical measurement.

34. **(Previously presented)** An apparatus according to claim 33, wherein the signal generator comprises a potentiostat configured to regulate a voltage at the auxiliary electrode.

35. **(Previously presented)** An apparatus according to claim 34, wherein the detector comprises a current detector configured to measure a current through the first electrode.

36. **(Previously presented)** An apparatus according to claim 35, wherein the potentiostat is configured to regulate the voltage of the first electrode relative to the auxiliary electrode and the current detector configured to monitor current between the first electrode and the auxiliary electrode.

37. **(Previously presented)** An apparatus according to claim 33, wherein the first biochip further comprises a reference electrode, the plurality of interconnects further includes a reference interconnect positioned for electrical communication with the reference electrode, the reference interconnect coupled to the signal generator such that the input signal is adjusted based on a voltage measured by the reference electrode.

38. **(Previously presented)** An apparatus according to claim 33, further comprising a multiplexor coupled to the detector and the plurality of interconnects, the multiplexor configured to identify a selected interconnect from the plurality of interconnects and couple the selected interconnect to the detector.

39. **(Previously presented)** An apparatus according to claim 38, wherein the detector is further coupled to the multiplexor, the multiplexor further configured to couple the selected interconnect to the detector.

40. **(Previously presented)** An apparatus according to claim 33 further comprising a digital filter coupled to the detector and configured to filter the output signal.

41. **(Previously presented)** An apparatus according to claim 40 further comprising an analog to digital converter coupled to the detector and the first electrode, the analog to digital converter configured to digitize the output signal.

42. **(Previously presented)** An apparatus according to claim 33, wherein the first biochip comprises an electron transfer moiety and the input signal is selected based on at least a property of the electron transfer moiety.
43. **(Previously presented)** An apparatus according to claim 42, wherein the electron transfer moiety comprises ferrocene.
44. **(Previously presented)** An apparatus according to claim 33, wherein each electrode of the array of electrodes comprises a self-assembled monolayer.
45. **(Previously presented)** An apparatus according to claim 44, wherein each electrode of the array of electrodes further comprises capture binding ligands.
46. **(Previously presented)** An apparatus according to claim 33 further comprising a second plurality of interconnects positioned for electrical communication with the array of electrodes of a second biochip of the plurality of biochips, the second plurality of interconnects further coupled to the detector.
47. **(Previously presented)** An apparatus according to claim 33 wherein the thermocontrollers each comprise a temperature sensor and a temperature regulator.
48. **(Previously presented)** An apparatus according to claim 47 wherein at least one of the temperature regulators comprise a Peltier thermal block.
49. **(Previously presented)** An apparatus according to claim 33 further comprising a processor coupled to the plurality of thermocontrollers and configured to provide a control signal to each of the plurality of thermocontrollers for thermal regulation of their respective station.
50. **(Previously presented)** An apparatus according to claim 49 wherein the processor is configured to receive desired thermal targets for each of the plurality of stations, and the control signals selected to achieve the thermal target at each of the stations.

51. **(Previously presented)** An apparatus for analysis of a plurality of biochips, each biochip comprising an array of electrodes and an auxiliary electrode, the apparatus comprising:

a plurality of stations, each configured to receive at least one of the plurality of biochips;

a plurality of interconnects associated with each station and positioned for electrical communication with the array of electrodes of each of the plurality of biochips and a plurality of auxiliary interconnects, each positioned for electrical communication with the auxiliary electrode of at least one of the plurality of biochips;

an active electrode select multiplexor coupled to the plurality of interconnects of each station;

a signal generator coupled to the plurality of auxiliary interconnects and configured to generate an input signal;

a detector coupled to the active electrode select multiplexor and configured to receive an output signal; and

wherein the active electrode select multiplexor is configured to select at least one of the interconnects as an active interconnect and electrically couple the active interconnect to the detector.

52. **(Previously presented)** An apparatus according to claim 51, further comprising an auxiliary electrode select multiplexor, the auxiliary electrode select multiplexor coupled to the signal generator and the plurality of auxiliary interconnects and configured to select at least one of the plurality of auxiliary interconnects as an active auxiliary interconnect and couple the active auxiliary interconnect to the signal generator.

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53.     **(Previously presented)** An apparatus according to claim 51, further comprising a plurality of thermocontrollers, each configured to independently thermally control one of the plurality of stations.